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ELECTRICITY COMES TO RURAL AMERICA



RURAL ELECTRIFICATION ADMINISTRATION

PA-109

U. S. DEPARTMENT OF AGRICULTURE

ELECTRICITY COMES TO RURAL AMERICA

Farming the Modern Way



NEATLY baled hay moving up an inclined elevator to a loft. An electrically powered mill grinding feed. Milk flowing through pipes into a stainless-steel container. A farmer lowering a can of milk into an electric cooler. Folks taking meat from a community locker plant. A dinner, piping hot, whisked by a farm homemaker from the oven of an electric range. A motor humming at the pump, and a hot shower after a hard day's work, a woman snapping a switch to start a washer churning. The smooth hum of an electric sewing machine. Young eyes watching a movie in a country school . . . or television.

Sounds clean and efficient and modern, doesn't it? Well, farm living and working is approaching something like that on hundreds of thousands of American farms whose operators enjoy central station electric service. Not all the electrified farms and rural areas in this sector have all these electrical advantages. But enough have these and many others to give people an idea of what modern living can be like.

Back in 1935, when only about 11 per cent of the farms had electricity, this sort of living was a vague dream. Only urban folks



snapped switches to move wheels and get light, or do the wash, or bake a cake, or make elevators move. Farm families knew the toil of the pump handle, the hot sadiron and the treadle-powered grindstone. They grew up in a coal-oil world where man lived by the sweat of his brow.

Yes, farming in 1935 was pretty much muscle work, and farm living was pretty drab. You pitched hay, and carried pails of water by the hour to the cows and chickens, and armfuls of wood for the old kitchen stove. There was the wash to be scrubbed, and the lamp chimneys to be cleaned. You couldn't do much outdoor work after dark because the barnyard was



pitch black — the work got done more slowly, or there was less work done. Jobs like shelling corn,

sharpening tools, sawing or hoisting took elbow grease and hours of drudgery, when they would have taken a few minutes or seconds in a modern factory.

No wonder some farm folks aged fast. No wonder young people left for the city—not only was the farm poor in conveniences, modern working tools and comforts, but schools were badly lit and often bare; communities lacked recreational, cultural, social advantages; job opportunities that only large centers of population offered. That was farming and rural living in 1935.

What has happened in the years between 1935 and the present? Why have doors opened in every direction for farm families—doors to a new kind of farming, new jobs in rural areas, new life of all kinds?

Let's Look Back

TO see what has happened since 1935, we have to look for a moment at what happened—or what didn't happen, rather—before that time.

Before 1935 not many people were greatly concerned whether rural people ever got electricity or not. And the old muscle method or gas-engine power seemed the only way to accomplish barnyard tasks. As for the farm wife—well, she just couldn't be expected to have all the comforts her sister in town had. If food spoiled for lack of refrigeration, if Dad's shirts got scorched with an iron heated too long on the wood range, that was bad luck. People in small villages, near the farms—service station operators, proprietors of country stores, church and school leaders—some of them had electricity, here and there, but like the farmers around them, they too depended mainly on hand power and kerosene lamps.

Electric power hadn't been brought to the farm because it cost too much. If a group of farmers wanted to get a power line strung out from town to their farms, they had to plank down sums ranging up to \$3,000 a mile to pay the power company for the construction. After the line was built, they still didn't have title to it. And sometimes their power cost them as much as 25 cents per kilowatt-hour.



Naturally there weren't many takers for a proposition of that kind. It's not surprising that of the country's 6 million or so

farms only slightly more than 3 per cent were receiving central-station service by 1925, and by 1931 only a little more than 10 per cent. Between 1931 and 1935 rural electrification was practically at a standstill. Utilities didn't see any profit in bringing power to most rural areas, and the rural areas shied away from paying the prohibitive costs involved.



REA is Born

THE bottleneck was broken in 1935. Funds to promote rural electrification under Government auspices were included in the Emergency Appropriations Act for that year, and an Executive order of May 11, 1935, created the Rural Electrification Administration. The Nation's farms needed power and the Nation's workers needed jobs. Thus REA was born.

It was seen rather quickly that rural electrification was a big job that could be done only over an extended period. Congress passed the Rural Electrification Act of 1936, setting up a long-term development program.

This is what the act did, briefly: It authorized REA to lend funds to cooperatives, public utility districts, municipalities, or private companies to finance the construction and operation of power lines, and power plants where necessary in order to bring central-station electric service to rural establishments not receiving it; and to finance the wiring of rural establish-

ments and purchase of appliances by those receiving service. The loans were to be repaid with interest over an extended period. Congress specified that applications from nonprofit and limited-profit groups should receive preference.

This was a new idea—that the Government should make possible the extension of electricity to rural United States. But it was easy to see why it was necessary. The job hadn't been done, and the rural areas were lagging far behind the rest of the country in obtaining every sort of labor-saving device and modern convenience.

So the start was made with the Rural Electrification Act. But to do more than make a start, REA had to find, from the very outset, a way to bring costs of electric service down to where the farm consumer could afford to make plentiful use of it, and to make it available to as many consumers as possible. Remember that high cost of service had been the bottleneck that kept large groups of farm people from getting electricity before 1935.

Utilities that had made an effort to develop rural service



before 1935 almost always extended the existing urban power lines out into the country, instead of trying to build rural lines engineered separately from the urban systems. Strictly speaking, there was no rural electric engineering. The few rural lines in 1935 were of heavy, expensive "battleship" type. Poles were close to each other and carried heavy cross arms.

Only a relatively small number of farms were served—those which could afford to pay the high cost. In general, only the farms near the highways down which the urban lines ran got service. The farms up on the hills, or isolated along the back roads, usually went without.



Service For Everyone

REA set out to change this in several ways. First, the practice of serving only the “cream” of the farms—those which could show an immediate profit to the power supplier—was abandoned. In its stead a new idea was born—that electricity should be made available to all rural establishments in a given area (farms, schools, churches, nonfarm dwelling units, industries, and all other potential users of electricity) where such service would be feasible under the pending terms provided for in the act. If anyone in an area could have power, everyone could have it.

Second, to make area coverage economically possible, REA tried to bring down the cost of line by redesigning some of the heavy equipment and at the same time strengthening other phases of line construction. What was needed was a low-cost, durable line. So REA engineers developed a simple type of construction characterized by the absence of a cross arm, with longer spans, and a stronger conductor. Such lines were built by REA borrowers, under REA supervision, for less than \$900 a mile. In some areas, prewar costs of distribution line were brought down to below \$500 a

mile. Since then hundreds of thousands of miles of this sturdy single-phase line have been built. Many private utilities use the same construction, but it is still identified in the rural mind as "the REA line."

These two principles of area coverage and low-cost construction combined to make a third. By bringing down the cost of service and by planning for service to all consumers in a given area, REA was able to show its borrowers how to apply mass-production methods for the first time to rural line building.

Laboring crews, often aided by the

eager farmers themselves cleared rights-of-way and dug holes for the new poles, while other crews came behind with the poles



and the hardware to go on them. Last came the crews to string the wire.

Now the new lines left the winding roads to cut across roads and fields, up hills and down valleys to farms far removed from existing lines—places which never could have been served by the old methods.

By serving all the consumers within an area, both large and small, in one integrated system, REA borrowers were able, with the aid of Government long-term, low-cost financing, to make economical service possible for all.

This method of extending service has been REA's fixed policy, and has proved to be the most practical way of getting the job done.

What's This Electricity?



REA's example in making practical the building of lines to entirely new areas stirred a ferment in rural United States.

Human, as well as natural energies were set in motion which seldom before had been tapped. Few realized the whole meaning of what was coming, but nearly everyone concerned with the new electrification movement felt that something big was in the air.

The old, largely self-imposed restrictions on rural line building by some private utilities still precluded much activity on their part, and, very early, groups of farmers began to form their own rural electric cooperatives to apply for loans from the new agency. From then on almost all loan applications have come from such cooperatives or, in some areas, from public utility districts.



These cooperative borrowers are in the pattern of those which have been formed by American farmers for many years to better their buying and selling position. They are democratic, self-owned, and self-operated groups, run by and for their members.

In many States the formation of the new type of utility organization required new legislation and other types of State-facilitating action. However, REA borrowers were significant chiefly as rural people banded together to operate their own electric systems. In some areas the mere crea-

tion of cooperatives, and especially their determined efforts on behalf of their members and those they hoped to serve, stirred violent opposition. But on the whole the existing power suppliers were tolerant, if not receptive, of the new groups which had tackled one of the biggest jobs lying before rural United States—electrification.



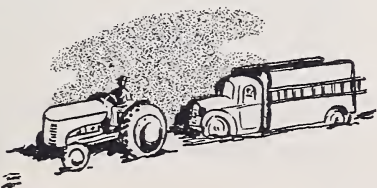
***“Give Me
a Hand,
Neighbor?”***

DURING a storm late one night, loud knocking on his kitchen door woke a farmer. He tumbled out of bed to find a wet and apologetic lineman from his rural electric cooperative. The lineman pleaded:

“I know this is an awful night to wake anyone, but we’ve been out on an emergency call and our truck is stuck in the soft shoulder down the road a ways. Can you hitch up your team and get us out?”

Later the line crew and the farmer, tired, but proud of a good job well done, drove back into the farmer’s yard. They found the farmer’s wife smiling, with a pot of coffee ready. And the linemen sat down for a moment of relaxation after a hard night’s work.

This sort of occurrence has happened not once, but hundreds of times, since the farm people started to develop their own electric systems. Members and employees feel a common



bond of interest in a task much bigger than themselves. The farm people are ready to sacrifice much in time and effort to keep on with the march of electrification.

Farm leaders have devoted many days to signing up their neighbors in the new electric cooperatives; in taking a census of unserved territory (both activities often required miles of driving); in attending cooperative board meetings, often until long after midnight, to make sure that the cooperative business was being conducted efficiently. This is a new kind of rural enterprise—some of the cooperatives are million-dollar businesses or bigger, and they take a lot of work, not only by the hired management and staff, but by their farmer-owners, to whom the Government has lent funds.

Businesses as big and as vital as these, the farmer decided, are worth protecting. They report lines menaced by trees. To save their cooperative money they have shouldered a new, simple kind of business responsibility — they make out their own



electric bills. And they make very few errors. Like the farmer roused at midnight, they give much of their own time and energy in order to help their neighbors and their

cooperative's employees.

REA files contain scores of letters reporting that lightning or other accidents had stopped meters. A dozen or so insisted that an estimated bill for service was too small.

As of December 31, 1949, a good-sized majority of the REA borrowers—including

municipal systems, public utility districts, private companies, and other types of power suppliers in addition to cooperatives—had paid back to REA on their loans nearly \$21,000,000 in advance of the due date. Total payments of nearly \$223,000,000 in interest and principal had been made on loans advanced totaling more than \$1,433,000,000. Payments in ar-



rears amounted only to less than $\frac{1}{2}$ of 1% of the total payments due. This is a record of which most commercial establishments could be proud.

The Poles Marched

WHEN REA first appeared on the national scene in 1935, only about 11 per cent of the Nation's farms were receiving central-station electric service. As the new kind of lines started to swing across the countryside, rural electrification from other sources matched it almost stride for stride. REA was the pacemaker that led the way to a long-overdue and welcome power development for the farmers of the United States. In 1936 and 1937 private utilities built rural lines faster than ever before.

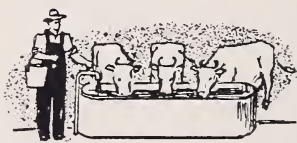
By 1940, the fifth anniversary of the creation of REA, slightly more than 30 per cent of the farmers were receiving electric power. Two years later rural electrification halted. The Nation was up to its neck in World War II, straining every resource, human and material, in its world-wide fight against Axis aggression. War production demanded every available ounce of metal and other substances that would normally be used for such badly needed

projects as rural electrification. In some parts of the country scores of miles of bare poles, forerunners of a new day for the countryside they spanned, stood with no line to be strung on them because no metal was available.

But the War Production Board, recognizing that only with electric service could many farms handicapped by a great labor shortage be able to keep producing food and fiber, released stocks of certain materials and manpower used for the manufacture of electrical line-building equipment. Farms which could show a specifically defined production use for electricity were permitted to be connected. Rural line building both by REA and private companies spurted. REA, for example, approved connections as rapidly during this period as the average rate during the first 10 years of its existence.

Results were not slow in appearing. Herds of dairy cows whose owners reluctantly had decided to dispose of them were saved. In not a few cases the dairymen found they had the time, with the help of electric milking machines, coolers, separators, and other mechanical devices, actually to milk more cows than before their hired hands went to work in a war plant.

Power In The Breach



FARMERS,
who must

make every hour count in their production of field crops, found electric service immensely helpful in making possible the

smooth and efficient running of grain elevators; it saved the labor and time of a couple of workers in pumping water for stock; it made almost automatic the grinding of feed at home; it furnished bright light in the barnyard to permit the night storing or processing of field crops; and it stepped up the production of pigs and



broilers. No one will ever determine accurately how greatly electric power, brought to so

many American farms for the first time, has helped to lick the labor dearth in the years of World War II. But it's certain that without that power, many, many valuable hours would have been lost to hard-pressed farmers trying to plant, cultivate, and harvest crops with one or more hands gone to war.

At this time when so much of the free world is dependent on America for food, electric power again is a large factor in the drive to increase yields. Much of the poultry in the United States, especially the small flocks, is

tended by farm homemakers.

Automatic water systems, water warmers



semiautomatic electric brooders, lights, and many other labor savers, kept many a woman in the poultry business who otherwise would have been crowded out by the press of home duties and other chores.

How many farm people would have had to quit farming in the years of World War II if they had not had electric service? How many would have had to reduce their

yields, their flocks, their herds, their acreage? Many signs indicate that their number is large.

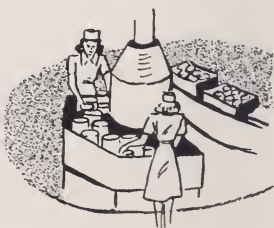
When did the change in farmers' outlook about electricity begin?

Well, farm mechanization started when the first wheel turned on the first farm, and had progressed steadily and slowly through the age of horse-drawn equipment, to the first crude, lumbering steam engine—then came the tractor, unwieldy at first, later compact and linked with complicated farm machines to do more and more field and barnyard jobs that muscle power formerly did.



The Factories Showed The Way

BUT while mechanization was developing slowly on American farms, what was happening in urban industry? A new force was coming to the forefront with the lighting of the cities. Electrification was changing the entire face of factory production. Machines formerly driven by steam power or operated by hand, were converted to an entirely new and more efficient drive, making for tremendously greater precision of control, ease and accuracy of operation, and elimination of unnecessary handling and other human factors. Mass-production methods were being pioneered, then perfected in the auto plants, later in other types of industry — all based on adaptation of



electrical principles of heat, light and power controlled to the needs of special operations.

Electricity, as we well know, wrought a complete technological revolution in American industry and economy—a revolution still going forward, with no end in sight.

More and more, farmers and other rural people are learning that they, too, can share in this revolution.

Dad Catches On

GRADUALLY the farmer lost some of his skepticism about the new-fangled electricity, as he had about the tractor a score of years before. He began to wonder how he could put it to work for him, as his wife was doing in the house.

Up in one of the northern Plains States, a farmer, tired of getting up in the middle of the night to wrap newborn pigs in a blanket and bring them in the house to keep them from freezing, figured out a way to drop an electric bulb with a re-

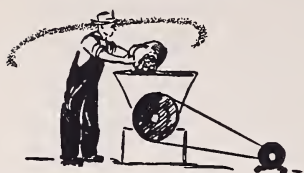
flector in a corner of his hog house, so the little pigs would crowd around it for warmth. His



neighbors copied this practice and the story got around. Now each farrowing season tens of thousands of pigs which otherwise would never survive their first week are saved for market because of this farmer's ingenuity — his simple, but revolutionary idea.

Feed for one's own or one's neighbor's livestock is at the heart of almost all American farming. Traditionally, feed is ground off the farm, or if done on the

farm, is ground by tractor power, in large quantities. A farmer regularly takes a half a day or more from other duties, to attend to grinding his feed.



But, as electricity became more available, electric motor-driven feed mills began to make their appearance — small mills that could grind grain automatically, while farmers went about their business. One Pennsylvania farmer found he could let his grain run down from overhead bins into his mill, from which it dropped automatically to his feeding troughs in his cow barn. This was the pattern adopted by many other farmers, who thus eliminated in one operation trips to town to get their grain ground, hours spent grinding the grain by tractor, and time spent moving the grain about.



Look at Electricity Work

SUCH examples of new and better ways of doing age-old jobs in the farmyard began to turn up in all parts of the country, as farmers awoke to the willing and tireless servant they had at the throw of a switch. Work simplification, an old story in factory management, became the object of increased attention by farm leaders and educators in the schools of Agriculture. Here are a few examples:

Cooling of milk is absolutely essential to Grade A dairy production. But hauling and storing of ice is difficult anywhere,

nearly impossible in warm climates. Electrically-powered farm cooling chests are a sure protection against milk or cream spoilage. One Georgia farmer's electric bill for cooling averages \$4 a month. His ice bill before he got electricity was 50 cents a day, and he had to haul the ice 20 miles. Thousands of farmers would not be in the business of producing high-grade milk today were they not using electric coolers.

In highly competitive truck gardening, the man who can get his early plants out of hotbeds first has a lead on his neighbors. Someone conceived the idea that electricity, instead of the use of manure or other device, would provide an even, steady, controllable heat for hotbeds. It worked—cable under the soil was highly successful.

Not a farmer in humid regions but who has lost hay because of rain, or who has had to delay cutting because of stormy weather. There's no need, with electricity available, to make hay only while the sun shines. For a farmer can now store his hay in the barn while it is still wet, and build his own electrically-powered hay-drying apparatus, which will force air up through the hay, curing it successfully and retaining vitamins and proteins that would be destroyed by the sun or lost if the hay dried in the field.

Probably more backs have been bent and shoulders stooped by pumping and carrying pails of water than by any other farm operation. Yet there's no reason for doing it, on an electrified farm. A pressure system can pump all the water needed on the average farm for a few cents a day. Farmers who have grown old pumping and hauling water for stock and poultry

not infrequently think of that use for an electric pump before piping the water into their houses.



Electric chick brooders, fireproof and time-saving; electric curing sheds for tobacco and sweet potatoes; electric milking machines and separators; electrically powered sprinkler and ditch irrigation; electric warmers for livestock water tanks; elevators of all kinds, electrically powered corn shellers, grinders, ensilage cutters, graders—these are but a few of the literally hundreds of ways in which farmers, helped by electrical specialists and by their own resourcefulness, put electricity to work saving time and labor for them. No wonder that farmers were considered, when Uncle Sam divided the available supply of materials for wartime use!

More Than 400 Uses

WHEN an electric line is built out to a farmstead, a completely different tool is made available to the family which lives and works there. Most farm tools have only one, or a few uses. But the electrical tool has more than 400 known uses on the farm and in the farm home, and more are being discovered constantly.

What is more, electric help enables a farmer to increase greatly the economy and efficiency of particular operations. Many operators of unelectrified dairy farms found that they had to reduce the number of cows during wartime labor-short periods. But Mr. and Mrs. Ernest Landgraff

of Sayre, Okla., milk 14 cows with the help of an electrical milker and two small daughters, whereas before Pearl Harbor they could milk only five cows by hand.

The J. W. Terrys of Portales, N. M. and their 10 children have converted a dry cow pasture to a fertile field. A 15-horsepower electric pump pours thousands of gallons of water onto land formerly cracked with dryness. In one year the Terrys produced 69,000 pounds of green beans, 1,200 pounds of black-eye peas, 1,000 pounds of corn, 200,400 pounds of sweet potatoes, 7 acres of spinach, 20,000 pounds of peanut hay, 2,000 pounds of melons, and 4,000 pounds of bean hay. Meanwhile, their original 90-acre farm produced enough grain sorghum to feed their livestock. And they had time enough to brood 1,500 chicks in five electric brooders. 750 pullets from this group produced more than 1,400 setting eggs for a local hatchery.

In poultry-raising areas, running water from electric pumps, and electric poultry-house lights are all-important. Near Logtown, Miss., Mr. and Mrs. J. M. Brown raise 250,000 pounds live weight of poultry per year. Their 10,000 active layers produce an average of 6,000 eggs daily. Thirty-one specially-built laying houses are wired for night lighting. In brooding houses, heat and all-night lighting to prevent crowding cut mortality nearly to zero. Two quick-freeze cabinets handle 2,000 pounds of poultry at a time, and an electric chicken-picker that removes all feathers by abrasion and suction does the work of six men. The Browns, whose home is equipped with major conveniences, say power cost on their farm





is insignificant. If power were not available, however they would

not be in business, they add.

These are outstanding examples of electricity at work in only three ways—in dairy, truck and poultry production. They show that farm people learn quickly how to put power to use, once they get it. And the figures bear out the facts. From 1941 to 1949, the total energy used by consumers on REA-financed lines increased about 8 times, although the number of consumers more than tripled during that time. Average consumption per farm on REA-financed lines increased from about 50 kwh a month in 1941 to 130 kwh in 1949.

What do these figures show? That, slowly, a great change is being wrought in rural American farming and living methods—that this new tool, as it becomes more familiar to farm families, exhibits its usability in many ways.

What Lies Ahead



LITTLE imagination is required to see, first, that this technological revolution on the farm is only beginning; and second, that it has tremendous appeal and opportunities not only for the present generation but also for youth who will be the rural citizens of tomorrow.

Young people learning technical skills in school will want power on the farms they operate. Many farm boys and girls have inspired their elders to try the new ways of farming. The electrical principles of heat, light and

power application are only starting to be grasped by the majority of American farm-

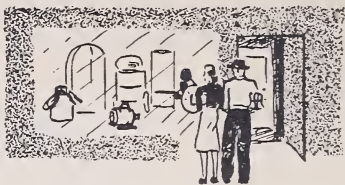


ers. As costs of power go down and as farm people more fully realize the lowered cost of electric service as it is used abundantly, farms which today apply electricity to a dozen ways of making a living, and for home comforts, will find scores of ways.

Today most farm products are processed far from the farm. With a more rational and intensive application of power principles, much primary processing will be done near where the products are grown—either on the farm or in rural communities. Youth will learn new skills, and new job opportunities will open a few miles from home or at home itself.

Rural communities in many cases have already been virtually transformed by the coming of light and power. Schools, churches, and community buildings have been made vastly more attractive and inviting. Hospital and other health facilities have been expanded in some neighborhoods, and the possibilities in this direction are great. A better-knit, more vital, more secure community results when electricity enters the picture—a community which holds its people because they *want* to live there.

Jobs To Be Done — Jobs To Be Created



ELECTRIFICATION of the remaining sixth of the Nation's farms and the rest of its rural areas now without service is a vital part of the program for a secure America.

For rural electrification spells jobs for thousands upon thousands of Americans, in addition to the farm people themselves. The mere bringing of electric service to the remaining farms and other rural establishments in the Nation is a construction task of tremendous proportions. The man-years required to do this task can be counted in the hundreds of thousands, and many types of workers will be needed.

Consider the ramifications of such a seemingly simple business as building an electric line to a farm. Metals for the conductor, for the hardware on the poles, and for the transformers and other line equipment must be mined and processed; trees must be cut and framed and creosoted for poles; all the materials must be transported by rail and truck to the places where they are to be used; rights of way must be surveyed, a path for the line laid out and cleaned. Then the lines must be strung—and afterwards, they must be kept in repair.

Think of the people needed for these and

many jobs—miners, factory workers, engineers, loggers, mill workers, clerks, stenographers, railroad workers, lawyers—scores of individual types of jobs.

But this is only part of the job picture.

Rural people who have electricity now and the many who will receive it within the next few years will together create a market of several billions of dollars for wiring, plumbing, and farm and household electrical equipment of all kinds. Furnishing them with this material will require many hundreds of thousands of man-years of direct and indirect labor.

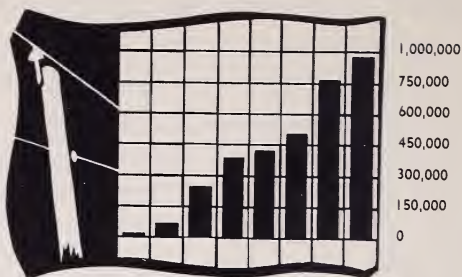
What are some of these jobs? Farms will have to be wired by electricians. Farm equipment is going to be made by factory workers out of raw materials mined and processed by thousands of other workers. Men and women will be needed to design new equipment, to demonstrate and sell it to the people who will use it. Plumbers and plumbers' helpers will be needed, with special knowledge of farm needs.

When rural areas become electrified, new factories open, seasonal jobs develop. Everything is modernized—more goods are sold to people who want more attractive homes and farms to keep in step with their new tools of farming and living.

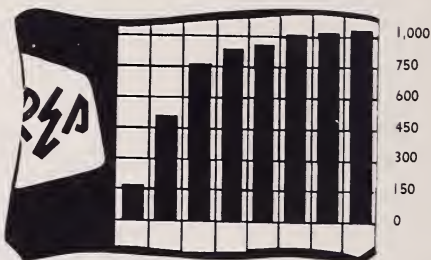
Our cities for years have had electric power in abundance. They have made sweeping technological advances. Our rural areas have lagged behind. There is no reason for the lag, once the steps ahead can be taken.



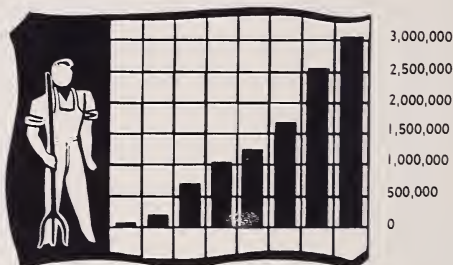
REA PROGRESS



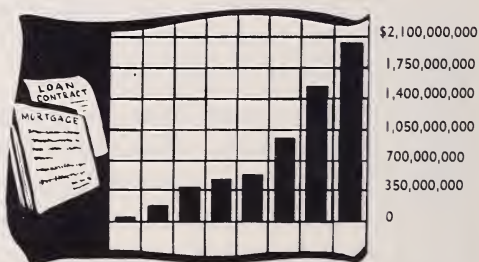
MILES OF LINE



BORROWERS



CONSUMERS



FUNDS ALLOCATED

1936 1938 1940 1942 1944 1946 1948 1949

CUMULATIVE TOTALS
DEC. 31 EACH YEAR

RURAL ELECTRIFICATION ADMINISTRATION
U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON 25, D. C.

